

REMARKS

Introductory Comments

As of the mailing date of the October 5, 2009 Office Action, claims 16 and 35-45 were pending in the present application. In the present amendment, claims 16, 41, and 42 have been amended, leaving claims 16 and 35-45 for consideration upon entry of the present Amendment. The claims have been amended as explained below. Reconsideration and allowance of the claims is respectfully requested in view of the foregoing amendments and the following remarks.

Claim Amendments

Claim 16 has been amended to characterize the step (a) product emulsion as “consisting of the alkenylsuccinic anhydride and the first starch component”. This amendment is supported, at least, by claim 16 as filed.

Claims 41 and 42 have been rewritten in independent form, incorporating the limitations of base claim 16.

Applicants are not conceding in this application that the amended claims would not have been patentable without the current amendments. The present claim amendments are intended only to facilitate expeditious allowance of valuable subject matter. Applicants respectfully reserve the right to present and prosecute the original versions of amended claims in one or more continuing applications.

Allowable Subject Matter

Claims 41 and 42 stand objected to as being dependent upon a rejected base claim but allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. 10/05/2009 Office Action, page 9, last full paragraph.

Claims 41 and 42 have been currently amended to rewrite them in independent form by incorporating the limitations of independent claim 16 from which they directly

depended. In view of these amendments, Applicants respectfully request the reconsideration and allowance of claims 41 and 42.

Anticipation or Obviousness Rejections over Conner

Claims 16, 35, 40, and 43-45 stand rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Conner et al. (6183550). 10/05/2009 Office Action, page 3, second paragraph. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as currently amended.

U.S. Patent No. 6,183,550 to Conner et al. (hereinafter “Conner”) generally describes aqueous paper size dispersions comprising: a) at least one paper sizing compound, and b) a water-soluble dispersant containing at least two hydrophilic groups and at least one hydrophobic group. Conner abstract. Conner’s paper size dispersion can, optionally, contain starch or modified starch. Conner, column 9, lines 25-29. However, Conner does not teach emulsifying the paper sizing compound in the presence of starch. To the contrary, Conner repeatedly teaches addition of pre-formed dispersion of sizing compound to a starch solution. See, e.g., Conner, Example 2 (especially column 11, lines 52-53), Example 6 (especially column 13, lines 30-38), Example 7 (especially column 13, lines 51-64), and Example 10 (especially column 14, lines 60-66). Conner Example 3 is silent with respect to the procedure used to prepare the dispersion. Thus, contrary to the Office’s assert at page 2, third paragraph of the present office action, Example 3 does not teach mixing a modified corn starch with the dispersant and sizing agent to form the emulsion. In fact, a skilled person would have been likely to have inferred that Example 3 built on the procedure of Example 1 by first adding molten AKD to an 80°C aqueous solution of M-Quat Dimer 18 to form a dispersion, then adding the starch stabilizer.

Applicants respectfully assert that claims 16, 35, 40, and 43-45 are neither anticipated by nor obvious over Conner because Conner does not teach or suggest Applicants’ claim 16 step (a) in which the emulsion formed consists of the alkenylsuccinic anhydride and the first starch component.

Anticipation requires that all of the limitations of the claim be found within a single prior art reference. *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir. 1991).

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Establishing a *prima facie* case of obviousness requires that all limitations of the claim be taught or suggested by the prior art. *See, e.g., CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003); *In re Royka*, 490 F.2d 981, 985 (C.C.P.A. 1974).

Applicants' claim 16, the only independent claim currently rejected, has been currently amended to include the limitation that the emulsion formed in step (a) consists of the alkenylsuccinic anhydride and the first starch component. Conner does not teach or suggest this limitation because Conner's sizing agent dispersions require a water-soluble dispersant that is excluded from the present claims. Accordingly, Conner does not anticipate claim 16, and Conner does not support a *prima facie* case of obviousness against claim 16. Claim 16 is therefore patentable over Conner. Claims 35, 40, and 43-45, which each depend from and further limit claim 16, are also patentable over Conner.

Applicants therefore respectfully request the reconsideration and withdrawal of the rejection of claims 16, 35, 40, and 43-45 under 35 U.S.C. § 102(b) or 35 U.S.C. § 103(a) over Conner.

Obviousness Rejections over Dauplaise + Pardikes

Claims 16, 39 and 43-45 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Dauplaise et al (6210475) in view of Pardikes (5653915). 10/05/2009 Office Action, page 4, last full paragraph. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as currently amended.

U.S. Patent No. 6,210,475 to Dauplaise et al. (hereinafter "Dauplaise") generally describes paper sizing emulsions, a method of making sizing emulsions, a method of

sizing paper products, such as paper and board, and paper or board made using the method and the sizing emulsions. Dauplaise abstract. The paper sizing emulsions contain at least one sizing agent and a cationic liquid hydroxyalkylated starch that is pumpable and at least partially degraded. Dauplaise abstract (emphasis added).

U.S. Patent No. 5,653,915 to Pardikes (hereinafter “Pardikes”) generally describes a paper coating system which introduces ASA particles having sizes in the sub-micron region into an emulsifier without shearing the emulsifier. Pardikes abstract. Pardikes encourages the use of cationic starches. Pardikes, column 2, lines 17-19 (“The two most common natural polymer emulsifiers (external phase) are corn and potato starch which are chemically modified to enhance their cationic charge characteristics”) (emphasis added).

Applicants respectfully assert that claims 16, 39 and 43-45 are patentable over Dauplaise and Pardikes because Dauplaise requires a cationic starch, whereas Applicants’ claim 16 first and second starch components exclude cationic starches.

Applicants’ claim 16, the only independent claim currently rejected, is a process claim that requires a first step (a) that forms an emulsion consisting of the alkenylsuccinic anhydride and the first starch component defined by a Markush group that excludes cationic starches; and a second step (b) in which the emulsion from step (a) is combined with a second starch component defined by a Markush group that excludes cationic starches. The primary reference, Dauplaise does not teach or suggest such a process because Dauplaise requires a cationic liquid hydroxyalkylated starch that is excluded from the claim 16 process. Dauplaise abstract. The secondary reference, Pardikes, cannot cure the deficiency of Dauplaise because Pardikes also encourages the use of cationic starches. The combination of Dauplaise and Pardikes therefore fails to support a *prima facie* case of obviousness against claim 16. Claim 16 is therefore patentable over Dauplaise and Pardikes. Claims 39 and 43-45, which each depend from and further limit claim 16, are also patentable over Dauplaise and Pardikes.

Applicants therefore respectfully request the reconsideration and withdrawal of the rejection of claims 16, 39 and 43-45 under 35 U.S.C. § 103(a) over Dauplaise and Pardikes.

Obviousness Rejections over Pandian + Pardikes

Claims 16, 35, 36, 38, 40 and 43-45 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Pandian et al. (5472485) in view of Pardikes. 10/05/2009 Office Action, page 6, last full paragraph. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as currently amended.

U.S. Patent No. 5,472,485 to Pandian et al. (hereinafter “Pandian”) generally describes sizing compositions containing: (a) a compound selected from the group consisting of alkenyl succinic anhydrides, alkyl ketene dimers and mixtures thereof and (b) a metal salt selected from the group of metals consisting of zirconium, hafnium, titanium and mixtures thereof. Pandian abstract. Pandian’s process of forming his sizing composition is described as a two-step process:

- a) Preparing an aqueous surface sizing compound by combining and mixing an aqueous solution of at least one water soluble or dispersible polymer or interpolymer, a solution or dispersion of auxiliary materials, and an aqueous solution of a metal salt, selected from the group of metals consisting of zirconium, hafnium and titanium, to the polymer solution;
- b) Adjusting the pH of the aqueous sizing compound from about 5 to about 10.5 by the addition of alkali, thereby increasing the molecular weight of the polymer or interpolymer by chemically or physically reacting the polymer or interpolymer with the salt of zirconium, hafnium or titanium, resulting in an increase in viscosity of the aqueous sizing compound;

Pandian, column 3, lines 13-26 (emphasis added). Thus, the first step of Pandian’s process is a “combining and mixing” step that requires his metal salt.

Pardikes is described above.

Applicants respectfully assert that claims 16, 35, 36, 38, 40 and 43-45 are patentable over Pandian and Pardikes because the cited references do not collectively

teach or suggest a dispersion preparation method that includes a step of forming an emulsion consisting of the alkenylsuccinic anhydride and the first starch component

Applicants' claim 16, the only independent claim currently rejected, is a process claim that requires a first step (a) that forms an emulsion consisting of the alkenylsuccinic anhydride and the first starch component defined by a Markush group that excludes cationic starches; and a second step (b) in which the emulsion from step (a) is combined with a second starch component defined by a Markush group that excludes cationic starches. The sizing compositions of the primary reference, Pandian, require a metal salt. The first step of Pandian's process is a "combining and mixing" step that requires his metal salt. Pandian therefore fails to teach or suggest Applicants' claim 16 process, which requires first forming an emulsion consisting of the alkenylsuccinic anhydride and the first starch component. The addition of the secondary reference, Pardikes, does not cure the deficiency of Pandian because Pardikes does not provide any reason (let alone a sufficient reason) for a skilled person to have modified Pandian to omit the required metal salt from the first step of Pandian's process. Pandian and Pardikes therefore fail to support a *prima facie* case of obviousness against claim 16, and claim 16 is patentable over Pandian and Pardikes. Claims 35, 36, 38, 40 and 43-45, which each depend from and further limit claim 16, are also patentable over Pandian and Pardikes.

Applicants therefore respectfully request the reconsideration and withdrawal of the rejection of claims 16, 35, 36, 38, 40 and 43-45 under 35 U.S.C. § 103(a) over Pandian and Pardikes.

Obviousness Rejections over Tsai + Pardikes

Claims 16, 35, 36, 38 and 43-45 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Tsai et al (5595631) in view of Pardikes. 10/05/2009 Office Action, page 7, last full paragraph. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as currently amended.

U.S. Patent No. 5,595,631 to Tsai et al (hereinafter “Tsai”) generally describes a method of sizing paper products using a size composition comprising an aqueous dispersion of:

a) cyclic dicarboxylic acid anhydride containing hydrophobic substitution, and b) cationic, non-degraded starch which is further modified to a DS of from about 0.005 to 0.4 with either:

- i) an ether group, R—O— where R is an hydroxyalkyl or alkyl of 1 to 4 carbon atoms, or alkenyl of 2 to 4 carbon atoms, or
- ii) an ester group,



where R is an alkyl of 1 to 4 carbon atoms or alkenyl of 2 to 4 carbon atoms;
and

wherein the non-degraded, fully modified starch has a viscosity of at least 1,000 cPs at 30° C. in an 8% aqueous solution.

Tsai abstract (emphasis added).

Pardikes is described above.

Applicants respectfully assert that claims 16, 35, 36, 38 and 43-45 are patentable over Tsai and Pardikes because Tsai requires a cationic starch, whereas Applicants’ claim 16 first and second starch components exclude cationic starches.

As described above in the context of the obviousness rejection over Dauplaise and Pardikes, Applicants claim 16 first and second starch components exclude cationic starches. In contrast, Tsai requires a “cationic, non-degraded starch”. Tsai abstract. Tsai therefore fails to support a *prima facie* case of obviousness against claim 36. The secondary reference, Pardikes, cannot cure the deficiency of Tsai because Pardikes also

encourages the use of cationic starches. The combination of Tsai and Pardikes therefore fails to support a *prima facie* case of obviousness against claim 16, and claim 16 is patentable over Tsai and Pardikes. Claims 35, 36, 38 and 43-45, which each depend from and further limit claim 16, are also patentable over Tsai and Pardikes.

Applicants therefore respectfully request the reconsideration and withdrawal of the rejection of claims 16, 35, 36, 38 and 43-45 under 35 U.S.C. § 103(a) over Tsai and Pardikes.

Obviousness Rejection over (Dauplaise OR Pandian OR Tsai) + Pardikes + Maher

Claims 37 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Dauplaise, Pandian, or Tsai in view of Pardikes and further in view of Maher (4769081). 10/05/2009 Office Action, page 8, last paragraph. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as currently amended.

Dauplaise, Pandian, Tsai, and Pardikes are described above.

U.S. Patent No. 4,769,081 to Maher (hereinafter “Maher”) generally describes enhancement of rate and ease of water dispersibility and/or water solubility of powdered or granular starch materials by the incorporation therein of a small but effective amount of a glycoside surfactant ingredient. Maher abstract. Maher is cited for teaching the cooking of starch. 10/05/2009 Office Action, page 9, second paragraph.

1. Dauplaise + Pardikes + Maher

Claim 37 depends directly from independent claim 16. As explained above in the context of the obviousness rejection over Dauplaise and Pardikes, those references do not support a *prima facie* case of obviousness against claim 16 because Dauplaise requires a cationic starch, whereas Applicants’ claim 16 first and second starch components exclude cationic starches. Also as explained above, the addition of Pardikes does not cure the deficiency of Dauplaise, because Pardikes also encourages the use of cationic starches. So, claim 37 is patentable over Dauplaise and Pardikes. The present rejection’s further addition of Maher, which is cited for teaching the cooking of starch, does not cure the

deficiencies of Dauplaise and Pardikes because Maher does not provide a reason for a skilled person to have disregarded Dauplaise's requirement for cationic starch. Accordingly, the combination of Dauplaise, Pardikes and Maher does not support a *prima facie* case of obviousness against claim 37.

2. Pandian + Pardikes + Maher

Claim 37 depends directly from independent claim 16. As explained above in the context of the obviousness rejection over Pandian and Pardikes, those references do not collectively teach or suggest a dispersion preparation method that includes a step of forming an emulsion consisting of the alkenylsuccinic anhydride and the first starch component. Also as explained above, the addition of Pardikes does not cure the deficiency of Pandian, because Pardikes does not provide any reason (let alone a sufficient reason) for a skilled person to have modified Pandian to omit the required metal salt from the first step of Pandian's process. The present rejection's further addition of Maher, which is cited for teaching the cooking of starch, does not cure the deficiencies of Pandian and Pardikes because Maher does not provide a reason for a skilled person to have modified Pandian to omit the required metal salt from the first step of Pandian's process. Accordingly, the combination of Pandian, Pardikes and Maher does not support a *prima facie* case of obviousness against claim 37.

3. Tsai + Pardikes + Maher

Claim 37 depends directly from independent claim 16. As explained above in the context of the obviousness rejection over Tsai and Pardikes, Tsai requires a cationic starch, whereas Applicants' claim 16 first and second starch components exclude cationic starches. Also as explained above, the addition of Pardikes does not cure the deficiency of Tsai, because Pardikes also encourages the use of cationic starches. The present rejection's further addition of Maher, which is cited for teaching the cooking of starch, does not cure the deficiencies of Tsai and Pardikes because Maher does not provide a reason for a skilled person to have modified Tsai to omit the required cationic starch. Accordingly, the combination of Tsai, Pardikes and Maher does not support a *prima facie* case of obviousness against claim 37.

Summary

For all of the above reasons, Applicants respectfully request the reconsideration and withdrawal of the rejection of claim 37 under 35 U.S.C. § 103(a) over Dauplaise, Pandian, or Tsai in view of Pardikes and further in view of Maher.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is respectfully requested.

It is believed that all the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicants' Attorneys.

Respectfully submitted,

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